

MAGNETIC FIELD GRADIENT COIL ASSEMBLY AND METHOD OF DESIGNING SAME

ABSTRACT OF THE DISCLOSURE

A method of designing a small-sized, self-shielding magnetic field
gradient coil assembly that is for use in an NMR spectrometer, provides high
approximation accuracy, is simple in structure, and has a large inside diameter. The
gradient coil assembly consists of tightly wound inner and outer coils. The
designing process starts with setting or resetting the number of the inner coils and the
number of turns of each inner coil. Their positions are optimized such that the
magnetic field gradient strength falls within a tolerable range under shielded
condition. Then, the number of the outer coils and the number of turns of each outer
coil are set. The Fourier components of a current distribution necessary for the outer
coils are calculated.